

oval; that of the posterior retractor small, elongated-oval, separate from that of the posterior adductor and situated immediately below the notch at the end of the ligament; nacre dark, dull plumbeous, tinged with green, more intense towards the beak cavity; scarcely iridescent posteriorly.

Length (of type) 69; height  $35\frac{1}{2}$ ; diam. 22 mm.

Types (No. 30902 Coll. Walker) from the Kribi River, 17 miles from Efulen, Kamerun. Cotypes in the collections of the Univ. of Mich., the Philadelphia Academy, the Carnegie Museum, and Dr. Louis Germain of Paris, France.

Ten specimens, in alcohol, of this very distinct species were sent by Mr. George Schwab to the museum of the Univ. of Mich., to whose curator, Dr. A. G. Ruthven, I am indebted for specimens for description.

By reason of its sculptured surface, it evidently belongs to the subgenus *Aspatharia* Bgt., as recognized by Simpson (1900) and Germain (1909).

In size, shape and in the peculiar sculpturing of the surface, which requires the use of a lens to develop the detail, it is easily distinguishable from both of the allied species.

Fearing that it might be included among the many new species recently discovered by the French naturalists, I submitted a specimen to Dr. Louis Germain of the Museum of Paris, the well-known expert on African Naiades, and am assured by him that it is entirely distinct from any of the described species.

Dr. A. E. Ortmann of the Carnegie Museum, who is making a special study of the anatomy of the Naiades, has kindly prepared the accompanying description of the soft parts.

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#### THE SOFT PARTS OF SPATHA KAMERUNENSIS WALKER.

BY DR. A. E. ORTMANN.

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I am obliged to Mr. Bryant Walker for sending me a complete specimen of the new species of *Spatha*, and the soft parts of two others, for examination. The specimen with shell proved to be a male; one of the other two was a sterile female, while in the third the gills were in too poor condition (crushed and torn), so that no attempt was made to ascertain the sex.

The following are the essential characters of the anatomy.

Anal opening closed above by the union of the inner edges of the mantle, *without leaving a supraanal opening*. The upper, closed portion is rather long, over  $1\frac{1}{2}$  times as long as the anal opening. The latter is rather large, about as large as the branchial opening, *separated from the branchial opening by the solid union of the inner mantle edges*. Inner mantle edge of anal opening smooth, that of the branchial opening with rather small papillæ. In front of the branchial opening, the inner mantle edges are unconnected and smooth.

Palpi longer than wide, with curved lower edge, posteriorly with a short truncation, but *not produced into a point*, and not connected.

Gills long and narrow, the inner the wider. Outer gill becoming gradually lower anteriorly, and ending at a point behind and above the posterior end of the palpi (at the highest point of the mantle attachment line). Inner gill hardly lower anteriorly, and *its anterior insertion fills the entire space between the anterior end of the outer gill and the palpi*, so that there is no gap between the posterior end of the inner palpus and the anterior end of the inner gill. Edge of inner gill with a longitudinal furrow, that of the outer gill without this furrow. Outer lamina of outer gill entirely connected with the mantle. Inner lamina of inner gill free from the abdominal sac, except at its anterior end; posteriorly, behind the foot, the two inner laminae of the inner gills are entirely connected, thus forming the larger anterior part of the diaphragm. All four gills *fall short of the posterior mantle edge, and the posterior continuation of the diaphragm is formed by the bridge uniting the mantle edges*, which, from the mantle edge, extends to a certain distance forward (or inward). This bridge, the mantle part of the diaphragm, is rather short; in the dissected female, the soft parts of which are about 68 mm. long, it is 4 mm. long, while the gill part of the diaphragm is much longer, about 29 mm.

Water tubes of both gills well developed, rather regular and quite distinct from base to edge of gill, but rather wide, and the septa are remote from each other. The latter are heavy and strong; in the male they are similarly developed in both gills, and represent simple lines of union of the tissue of the two laminae, generally with a large blood vessel in the middle. In the female, the structure of the outer gill is identical with that of the male; but *the inner gill alone is*

*marsupial*: the septa are more strongly developed, but keep about the same distance from each other as in the male; they are longer in the transversal direction, and possess, at their insertion at the outer lamina of the gill (primary limb) a *marked swelling*, within which generally the blood vessel is located.

The structure of the soft parts of this species of *Spatha* is remarkable for the following *six* particulars.

1. The complete absence of a supraanal opening.
2. The separation of the anal and branchial opening by a bridge formed by the mantle.
3. The contact of the anterior insertion of the inner gill with the posterior insertion of the inner palpus.
4. The absence of a posteriorly produced point of the palpi.
5. The marsupium, which is restricted to the inner gills.
6. The peculiar shape of the septa of the marsupial gill.

Among *North American* shells, I have observed a similar absence of the supraanal opening only in *Lampsilis parva* (Barn.), but this is a secondary modification: is not always present, and all the related forms have such an opening. In *Margaritana* and certain species of *Quadrula* (*Rotundaria*), where a supraanal is also absent, the mantle edges have no tendency to close the anal above, and thus represent another type of structure. With these exceptions, *I have never seen any one of the above characters in any species of North America*. There is always a distinct supraanal opening; the separation of the anal and branchial openings is never formed by the mantle edge, and the diaphragm consists of the gills alone; the anterior insertion of the inner gill is always more or less, generally widely, separated from the posterior insertion of the palpi; the palpi are always drawn out into a posterior, projecting point, and are more or less falcate; and the marsupium is never in the inner gill alone, but either in both gills or in the outer one. As regards the shape of the septa of the marsupial gill, it is unlike anything I have seen in *North American* forms. Unfortunately I cannot tell how far this shape changes in the gravid females, but I think, that the swelling of the gill, when charged, will not be very considerable.

It is clear, that these are very important differences. Simpson (Pr. U. S. Mus. 22, '00, pp. 515 and 895) places *Spatha* in the family *Mutelidæ*, the chief characters of which are the hinge teeth, which, when present, are taxodont, and the shape of the embryo,

which is a lasidium. In *Spatha* there are no, or hardly any, hinge teeth, and they are surely *not* taxodont. The embryo is unknown to me. Yet the above characters of the soft parts fully justify the separation of this genus from the North American *Unionidæ*, and I do not hesitate to affirm, that *Spatha* should stand in a different family, which may be called *Mutelidæ*, if the genus *Mutela* should prove to be allied in the structure of the soft parts. Whether the other genera placed by Simpson in this association actually belong here, remains to be investigated.

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#### DESCRIPTION OF A NEW SPECIES OF TRUNCILLA.

BY BRYANT WALKER.

TRUNCILLA LEWISII n. sp. Pl. III, figs. 3, 4, 5.

Male shell quadrate, subcompressed; thick, solid; dark reddish-yellow, with faint, radiating lines of green; beaks laterally compressed, eroded, but apparently only slightly elevated above the hinge-line, sculpture not seen; anterior end regularly rounded, forming an obtuse angle at its junction with the basal emargination, which is nearly straight; dorsal line curved; posterior end slightly emarginate and terminating in a broad biangulation, which projects slightly beyond the posterior and basal lines; a broad, flat groove extends from the beaks to the basal emargination, widening and deepening as it approaches the base; posterior ridge prominent, rounded towards the beak, but becoming flattened and obsoletely biangulated as it approaches the posterior end; immediately in front of the median groove, there is a strong anterior ridge, which becomes more pronounced as it approaches the base, where it terminates in the angle at the anterior end of the basal emargination, it is more or less roughened by the accentuation of the lines of growth, which elsewhere on the disk are not very strongly developed; dorsal slope concave behind the posterior ridge; interdendum rather long, narrow, rounded and parallel with the hinge; pseudo-cardinals in the left valve, two, the anterior very narrow, straight, directed obliquely forwards and slightly widening towards the anterior end, the posterior triangular, the space between them triangular and extending to the hinge; in the right valve, two, the anterior smaller, but well developed, the posterior long, triangular, the space between them